REMARKS

Claims 1-39 are pending in the present application. No claims are amended in this paper.

In the Office Action mailed July 23, 2003, objection is made to claims 5, 9, 18, 22, 31, and 35 for use of parentheses to enclose "reference characters." In fact, the parentheses in these claims are used in accordance with set notation to denote ranges, not reference characters. Mathematical precision, and thus clarity, would be lost if the parentheses were removed. Accordingly, Applicants submit that these claims are formally sufficient and request that the objection be withdrawn.

In the Office Action, claims 1-39 are rejected for obviousness over US Patent 6,542,558 ("Schulist") in view of US Patent 6,526,531 ("Wang"). That rejection is respectfully traversed for the following reasons.

Prima facie, rejection of a claim for obviousness over a combination of references requires a showing of motivation to make the combination, a reasonable expectation of success, and teaching or suggestion of all elements or steps and limitations thereof in the combination. See MPEP § 2142, et seq.

Taking claim 1 as representative, a method for reducing a decoder's power consumption in a communication system includes "estimating a quality metric of a segment of a received signal," followed by determination of a quality metric threshold, delimiting an interval with respect to a "modified quality metric threshold," and "decoding the segment when the estimated quality metric is outside the interval." In this regard, the aim of the claimed subject matter is to enable a receiving station to decode a current packet before it has been transmitted in its entirety based on an estimate of SINR (signal to interference and noise ratio) of a signal received in early slots of the current packet. This allows early termination of transmission of the current packet, which increases the effective data rate of the communication system. See the specification at page 6, lines 10-16 and at page 1, lines 24-31.

Schulist's turbo decoding architecture uses a modified SNR (signal-to-noise ratio) generated in the power control loop of a receiver to support turbo-encoded information sequences. However, Schulist disfavors the use of short periods to generate SNR estimates. For

example, Schulist says that "fast," relatively short-term SNR estimates are generally inaccurate and fluctuate substantially, and reliance on inaccurate SNR estimates tends to increase error rate associated with the decoded signal." See Schulist at column 4, lines 34-40. Schulist categorizes "frame-based SNR estimates" as fast, relatively short-term estimates. See Schulist at column 4, lines 29, 30. Wang, on the other hand, iteratively decodes a frame of encoded data and decides when to terminate decoding of the frame early based on a comparison with error detection information included in the frame. So, it can be said that Wang conducts a "fast," relatively short-term" estimate of a quality metric in a frame of data to decide whether to continue or terminate decoding of the frame, in contravention of Schulist's disapproval of such measurement periods. Further, Wang's preferred quality metric is BER (bit error rate) calculated with each decoding iteration from CRC (cyclic redundancy check) data in a current frame. Decoding of the current frame is terminated based upon a comparison of the current frame's BER with the BER of a previous frame. This is because Wang perceives an implied risk in using SNR as the quality metric; "...BER may not be monotonically decreasing with the SNR of the input signal...." See Wang at column 3, lines 1-10. Accordingly, Schulist's use of measured SNR and disfavoring of fast, relatively short-term estimates teaches away from combining Schulist's turbo decoding architecture with Wang's threshold detection of BER on a frame-by-frame basis.

Schulist, at least, suggests failure of the combination of a turbo decoder employing a constant or nearly constant SNR as a quality metric with Wang's early termination based on threshold detection of BER measured from frame to frame because of the purported "general inaccuracy' of such fast, relatively short-term estimates.

Finally, claims 1, 14 and 27 require estimation of a quality metric "of a segment of a received signal." In contrast, Schulist teaches away from use of SNR based on "fast," relatively short-term estimates" because of their general inaccuracy and substantial fluctuation. Schulist therefore does not include "estimating a quality metric of a segment of a received signal." Further, as pointed out in the Office Action, Schulist does not teach "delimiting an interval in accordance with a modified quality metric threshold." Finally, neither Schulist nor Wang teaches "delimiting an interval in accordance with a modified quality metric threshold" and "decoding the segment when the estimated quality metric is outside of the interval." Because of purported "general inaccuracy," Schulist does not decode "segments" based on an estimated quality metric

of a "segment" of a received signal. Wang initiates decoding of a frame and checks parity <u>before</u> delimitation takes place. See steps 401-406 in Wang's FIG. 4. Further, in Wang "decoding" precedes "delimiting" which precedes "termination." Stated another way, Wang teaches "decoding" without regard to any interval. In contrast, in claims 1, 14, and 27, "delimiting an interval" precedes "decoding" because the "decoding" step is performed "when the estimated quality metric is outside of the interval." Accordingly, the combination omits one or more elements and one or more limitations of claims 1, 14, and 27.

With respect to claims 2, 15, and 28, Schulist teaches away from estimating the signal-to-noise ratio of "a segment of a received signal" for reasons given above.

With respect to claims 3, 16, and 29, Schulist expressly disfavors "estimating a quality metric of a slot of a received signal." A "slot" is one of the "fast," relatively short-term estimates" that, according to Schulist, are "generally inaccurate." See Schulist at column 4, lines 5-40. The contention in the Office Action is that "the method of estimating a slot is known in the art" and "practiced by most signal-to-noise estimators." Applicants respectfully submit that, in the context of all the limitations of these claims, it is not known in the art to "estimate a slot." Applicants therefore respectfully request submission of an affidavit, Official Notice, or a reference to support this contention. See MPEP § 2144.03.

With respect to claims 4, 17, and 30, Schulist, for reasons already given, expressly disfavors "determining a quality metric threshold" based on any characteristic of a "segment" of a received signal.

With respect to claims 5-12, 18-25, and 31-38, as admitted in the Office Action, neither Schulist nor Wang teaches delimiting an interval in accordance with a modified quality metric threshold "comprising a parameter" defining a formula. The contention in the Office Action is that such would have been apparent to one of ordinary skill because "parameters are required" in most programs to define a variable of constant value. This may be an abstract mathematical truism; however, the specific parameters set forth in these claims and defined and explained in the specification are not manifest from the "requirement of parameters." Applicants respectfully submit that, in the context of all the limitations of these claims, it is not apparent to one of ordinary skill to "define an interval with a formula "$(-\infty, TS + \Delta_0)$, where TS is the quality

metric threshold." Applicants therefore respectfully request submission of an affidavit, Official Notice, or a reference to support this contention. See MPEP § 2144.03.

With respect to claims 13, 26, and 39, it is respectfully submitted, for reasons already given, that neither Schulist nor Wang, nor the combination thereof, teaches or suggests "delimiting an interval," then "decoding the interval" when the estimated quality metric is outside the interval. Accordingly, the combination cannot and does not teach or suggest those steps further limited by steps of "evaluating" a stopping criterion and "terminating decoding."

Specification

Applicants provide herewith amendments to the specification. The amendments to the specification are made by presenting marked up replacement paragraphs which identify changes made relative to the immediate prior version.

The changes made are primarily typographical or grammatical in nature, or involve minor clarifications of awkward wordings.

Applicants believe that these changes add no new matter to the application and are fully supported by the original disclosure.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants submit that all pending claims in the application are patentable. Accordingly, reconsideration and allowance of this application are earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

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By: _____

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